

# Disordered Eating: What are the Potential Roles of Perfectionism and Emotional Reactivity?

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Perfectionism and emotional reactivity are identified risk factors for disordered eating (DE) in adults and adolescents, yet research in preadolescents is scarce. Further to this, limited research has explored how these risk factors may act together to influence DE. This study investigated the associations between perfectionism, emotional reactivity, and DE in preadolescents, alongside the mediating role of emotional reactivity between perfectionism and DE. Sixty-seven preadolescents (M age = 10.9 years; 52.2% male) self-reported their levels of DE, and self-oriented and socially prescribed perfectionism. Measures of emotional reactivity were collected by observing participant anxiety expressions in response to a stress-inducing laboratory task. Regression analyses revealed that socially prescribed, but not self-oriented perfectionism, significantly explained variance in DE; however, emotional reactivity was not significantly correlated with either perfectionism dimensions or DE. These findings suggest socially prescribed perfectionism may be more broadly associated with DE, whilst self-oriented perfectionism is less influential on DE during preadolescence. Altogether, these findings highlight the value of investigating associations between common risk factors and DE in younger populations to better understand the emergence of eating psychopathology.

## INTRODUCTION

Eating disorders (EDs), such as anorexia nervosa and bulimia nervosa, are disabling mental health conditions that affect over 700,000 individuals in the UK (National Institute for Health and Care Excellence [NICE], 2024; Santomauro et al., 2021). EDs have one of the highest mortality and suicide rates of any psychiatric condition (Galmiche et al., 2019), with suicide accounting for 1 in 5 deaths among people with EDs (Arcelus et al., 2011). Furthermore, ED symptoms can be highly heterogeneous both within and across diagnoses, making treatment and recovery a challenging process (Levinson et al., 2022). Disordered eating (DE) behaviours are described as subclinical eating attitudes or behaviours, and are a prerequisite for developing diagnosable EDs (Smolak & Levine, 2015; Thomas et al., 2021). Most research exploring DE is targeted towards adolescence and adulthood, despite evidence demonstrating that DE can begin during childhood and preadolescence (Herle et al., 2020). DE can persist from childhood into adulthood (Kotler et al., 2001), creating a high risk for future ED development (Pursey et al., 2021). Therefore, it is becoming increasingly important for research to establish preadolescent risk factors in order to facilitate potential interventions that mitigate the progression of eating pathology. Two potential risk factors that are associated with DE include perfectionism and emotional reactivity (Evans et al., 2019; Lilienfeld et al., 2006). The current study aimed to explore the association, and potential interaction, of these variables with DE in a community sample of preadolescents.

*Perfectionism* is defined as the propensity to seek exceptionally high standards (Chang et al., 2008). Whilst it is considered a typical antecedent of EDs, few studies have assessed perfectionism in relation to DE in preadolescents (Rosewall et al., 2019). In adults, elevated perfectionism is found in individuals with a lifetime history of DE relative to healthy controls (Forbush et al., 2006). Additionally, individuals with EDs, as opposed to other psychiatric disorders, retrospectively report higher levels of perfectionism during childhood (Wade et al., 2016). In adolescents, Ferreiro et al. (2012) found that perfectionism predicted DE in girls over time, and Boone et al. (2011) reported that perfectionism was related to symptom severity in bulimia nervosa. Such perfectionistic tendencies during youth are hypothesised to be maladaptively applied to body shape and weight, resulting in the development of DE (Johnston et al., 2018); however, research is needed in a community sample of preadolescents to determine the presence of perfectionism as a potential early risk factor for DE.

Perfectionism in children and adolescents can be conceptualised as self-oriented (i.e., having extremely high standards for oneself) or socially prescribed (i.e., perceiving others as demanding perfection from oneself) perfectionism (Flett et al., 2016). Self-oriented perfectionism (SOP) is denoted as adaptive, and is generally related to positive psychological wellbeing and high self-esteem (Haynos et al. 2018; Oros et al., 2017). Socially prescribed perfectionism (SPP) is found to predict psychopathology across age groups (Malivoire et al., 2019; Lozano et al., 2015). In regard to DE, SPP is evidenced as more broadly associated with ED symptoms and attitudes than SOP in children, adolescents, and adults (Flett et al., 2016; Hewitt et al., 1995). However, both perfectionism dimensions are found to be independently linked to ED symptoms

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(Sherry et al., 2003). Therefore, such mixed findings highlight a need for research to detangle how the dimensions of perfectionism correlate with DE, to establish which aspects are potential risk factors in preadolescents.

Emotional reactivity is described as a sensitivity to experiencing emotions, including how intensely, frequently, or persistently they are experienced (Nock et al., 2008). Elevated emotional reactivity in response to experimentally induced interpersonal stress, such as presenting participants with a mock job interview, is reported in women with EDs (Monteleone et al., 2020). There is also evidence that emotional reactivity is related to emotional under or overeating in preschool children (Messerli-Burgy et al., 2018) and the development of DE over time in adolescents (Juarascio et al., 2016). Furthermore, Goldschmidt et al. (2014) found that women with bulimia nervosa engaged in DE behaviours in response to daily stressors, suggesting a link between increased emotional reactivity and DE; however, there is limited research which examines emotional reactivity and DE in preadolescents, despite the changes in emotional reactivity that occur at the onset of puberty (Dahl & Gunnar, 2009). Vulnerability during this period may lead preadolescents who are emotionally reactive to utilise DE behaviours as an emotion regulation strategy (Bodell et al., 2022). Hence, research is required to identify emotional reactivity as a potential correlate of DE in preadolescents.

Furthermore, emotional reactivity and perfectionism may jointly influence DE. Individuals with perfectionistic standards may perceive failure and rejection more frequently, and with higher appraised significance or detriment (Hewitt et al., 2002). Therefore, preadolescents with increased emotional reactivity may experience failures more intensely. In turn, this may lead to DE behaviours that function to alleviate the negative affect associated with not meeting their own or other's high expectations (Asl et al., 2021; Evans et al., 2019). Accordingly, high emotional reactivity may mediate the association between perfectionism and DE, such that high emotional reactivity may underlie the association between elevated perfectionism and DE. One study by Donahue et al. (2018) found that the relation between SPP and DE was moderated by a lack of adaptive emotion regulation strategies, but emotional reactivity was not considered in this model. Past this, seemingly no research has investigated emotional reactivity as a mediator in the association between perfectionism and DE.

The present study aimed to build upon the current literature by examining the associations between perfectionism, emotional reactivity, and DE in a community sample of preadolescents. In addition, it examined the potential mediating role of emotional reactivity in the association between perfectionism and DE. This study employed measures validated for a preadolescent sample: the Children's Eating Attitudes Test (ChEAT; Maloney et al., 1989), the Child-Adolescent Perfectionism Scale (CAPS; Flett et al., 2016), and the child-adapted version of the Trier Social Stress Test (TSST-C; Buske-Kirschbaum et al., 1997). Our first hypothesis was that preadolescents with higher levels of SOP, SPP, and emotional reactivity would also report elevated levels of DE. In relation to theoretical proposals, this study secondly hypothesised that higher levels of emotional reactivity in preadolescents would mediate associations between the dimensions of perfectionism and DE.

## METHODS

### Ethics

The wider research (Thomas, 2022) and this study, were approved by the Cardiff University School of Psychology Ethics Committee (EC.19.02.12.5566GR3A3; EC.19.02.12.5566GR6A7). Prior to participation, parents/guardians and children received information regarding the study. Parents/guardians gave informed opt-in consent, while children gave assent. After study participation, children and parents/guardians were appropriately debriefed and provided with the contact details of the researchers and support organisations for whom they could contact if they deemed necessary.

### Participants

Seventy-four participants' data were collected for this study from a community sample as part of a larger project. This project recruited participants across two stages, between August 2019 and September 2021 in south Wales (specific details can be found in Thomas, 2022). For the

first stage of recruitment, children who had participated in the prior school-based study were invited to participate in the current laboratory study. Participants recruited in the second stage were invited to participate through social media posts and a Cardiff University recruitment database.

Study recruitment had the following exclusion criteria: premature birth, uncorrected vision, serious developmental delays, and neurological difficulties related to serious head trauma ( $N = 0$ ). In accordance with the task exclusion criteria, seven children were removed for task incompleteness and wearing face masks. The latter impaired the ability of the coders to assess the children's expression during the TSST-C. Demographic data of the final sample were collected for participant age, gender, and ethnicity, alongside parent age and socioeconomic status. Details of the final demographics are shown in **Table 1**.

**Table 1**

*Final Sample Demographics.*

Participant	M (Range)
Age (years)	10.91 (10.00-11.83)
Gender (male %)	52.20
<b>Ethnicity (%)</b>	
White	
Mixed of Multiple Ethnic Groups	80.60
Asian or Asian British	3.00
Other Ethnic Group	4.50
Black, African, Caribbean, or Black British	7.50
Missing Data	4.50
<b>Parent Demographics (N=67)</b>	
SES (WIMD) Quartile (%)	
1st (most deprived)	20.90
2nd	19.40
3rd	13.40
4th (least deprived)	46.30

*Note.* SES: Socioeconomic status, WIMD: Welsh Index of Multiple Deprivation

## Materials

### Children's Eating Attitudes Test (ChEAT)

The ChEAT (Maloney et al., 1989) is a 26-item self-report measure of child DE attitudes and behaviours. It was adapted from the 26-item Eating Attitude Test (EAT-26; Garner & Garfinkel, 1979) and assesses worries about being overweight, bingeing and purging, food preoccupation, and dieting in 8 to 13-year-olds. Children rate items on the measure using a 6-point response scale to illustrate the frequency they display the behaviour or attitude. Traditional scoring methods of the ChEAT are found to restrict and positively skew the variability within the data (Thomas, 2022; Smolak & Levine, 1994). Therefore, the present study utilised an alternate procedure that scores item responses from 1–6 (Never–Always), with total scores ranging from 26 to 156 (Anton et al., 2006). Greater total ChEAT scores represent higher levels of DE.

Items on the scale were reworded or simplified to increase understanding (Thomas, 2022). Item 4, "I have gone on eating binges where I feel that I might not be able to stop" was adjusted to "I have started to eat and then felt like I cannot stop" after Coombs et al. (2011) recommended that children struggled to comprehend the word 'binge'. Furthermore, items that specified "vomit" (9 and 26) were presented alongside the words "am/be sick", and item 21 was amended to "I spend too much time thinking about food" from the initial "I give too much time and thought to food". The altered wording and adjusted scoring had an acceptable Cronbach's alpha ( $\alpha = .73$ )

### Child-Adolescent Perfectionism Scale (CAPS)

The CAPS (Flett et al., 2016) is a 22-item self-report measure of SOP and SPP in children, developed from the Multidimensional Perfectionism Scale (Hewitt & Flett, 1991). The SOP subscale has 12 items, while the SPP subscale has 10 items. Children rate items on a 5-point scale to demonstrate how much they identify with the perfectionistic beliefs or tendencies: 1 – false-not at all true of me, 2 – mostly false, 3 – neither true nor false, 4 – mostly true, and 5 – very true of me. Items 3, 9 and 18 were reverse-scored. Total scores were summed and range from 22 to 110, with greater scores representing higher levels of perfectionism. CAPS demonstrates good internal consistency (SOP  $\alpha = .81$ ; SPP  $\alpha = .84$ ) and suitable test-retest reliability at 1 year (SOP  $\alpha = .65$ ; SPP  $\alpha = .59$ ) (Flett et al., 2016). The current study found an acceptable Cronbach's alpha for both SOP ( $\alpha = .76$ ) and SPP ( $\alpha = .78$ ).

### Trier Social Stress Test for Children (TSST-C)

The TSST-C (Buske-Kirschbaum et al., 1997) is a behavioural task adapted from the adult TSST (Kirschbaum et al. 1993), which is considered to be a gold standard procedure in experimentally induced stress research (Allen et al., 2017). It is designed to induce psychosocial stress in children and its outcomes can be used to measure emotional reactivity (Allen et al., 2017). In this test, children are typically asked to finish the ending of a given story in an exciting manner and better than their peers, followed by a surprise mental arithmetic test in front of a camera and a panel of adults; however, children in the present study only completed the mental arithmetic task due to time constraints. All other details remained the same.

Video recordings of the TSST-C were coded using the Child and Adolescent Stress and Emotion Scale (CASES; Burkholder et al., 2016), which measures verbal, facial and bodily anxiety expressions made by children. This coding scheme scores children using a 4-point Likert scale (0 – no observed anxiety expressions, 1 – mild expressions, 2 – moderate expressions, and 3 – severe expressions). Anxiety expressions were coded in 10 second windows using EUDICO Linguistic Annotator (ELAN; Version 6.4; The Language Archive, 2022), with two coders who were not involved in data collection and blind to the participants' other results. Total scores for each anxiety expression type were summed, with higher scores reflecting greater anxiety expressions. The current study demonstrated good inter-rater reliability across 6 videos ( $\alpha = .95$ ).

### Statistical Analyses

Data were analysed using SPSS (Version 27.0; IBM, 2020). Two-tailed analyses were implemented and a p-value of 0.05 defined statistically significant results. Data were screened and plotted to identify potential floor or ceiling effects, and to examine data distribution. CASES, SPP and ChEAT data all violated normality assumptions according to the Shapiro-Wilk test. Successful Log transformations were performed to correct ChEAT and SPP data; however, CASES normality remained violated after transformations. Visual inspection of the untransformed data on the CASES' histogram deemed the normality to be allowable; however, non-parametric tests (Spearman's rank correlation) were also performed and were comparable to parametric test results unless reported otherwise.

Preliminary analyses were conducted to determine whether age, gender, ethnicity, parental age, and socioeconomic status were covariates of DE. These analyses were non-significant (see Appendix), and demographic variables were therefore not included in the following analyses.

Pearson's *r* correlations were used to test the primary hypotheses for associations between the perfectionism dimensions, emotional reactivity, and DE. Linear regressions were employed for the significant associations. To examine the secondary hypothesis, hierarchical regressions were used to explore significant associations between all variables. This allowed for the associations between perfectionism dimensions and DE to be examined whilst controlling for emotional reactivity. This was followed by mediational analyses, which were used to investigate whether emotional reactivity was a mediator in the association between perfectionism dimensions and DE. Variance inflation factor was used to examine multicollinearity and was found to be at an acceptable level.

### Procedure

All children attended the laboratory session with a parent or guardian present. Children who participated in the first stage of the larger project completed the ChEAT questionnaire at school, whereas children recruited through the second stage of the project completed the ChEAT at the laboratory. All children completed the CAPS questionnaire at the laboratory. Children then participated in several neurocognitive tasks that were not part of the current study, including a Go/NoGo task, set shifting task, and a central coherence task. Afterwards, each child was guided to a second room to sit in front of two researchers, a camera, and a one-way mirror that their parent stood behind, unbeknownst to the child. Once the child was settled in the room and in front of the camera, instructions for the mental arithmetic TSST-C began.

Firstly, children were told they were going to be recorded completing a maths test. In the mental arithmetic task of the TSST-C, participants were asked to subtract the number 7 from 758 as accurately and fast as they could. If the child made an error, they were told to restart at 758 with the phrase "Not quite, please start again". If five consecutive errors were made or the child had difficulty continuing after fewer errors, the experimenter altered the task to subtracting 3s from 307. The task lasted for 5 minutes, after which the child rated how stressful the task was from 1–10 as a manipulation check. They then received feedback and were told the true nature of the task. Following the TSST-C, children completed a frustration task as part of the larger project before being fully debriefed alongside their parents, receiving a prize as compensation for their time.

### RESULTS

Whole sample descriptive statistics for all study variables are presented in Figure 2. ChEAT, CAPS and CASES scores demonstrated some variability.

Figure 2

Whole sample descriptive statistics for untransformed study variables.

	M (SD)	Min - Max
ChEAT	59.25 (12.17)	35-90
CAPS – Self-Oriented	32.76 (8.53)	15-54
CAPS – Socially Prescribed	19.55 (7.15)	9-37
CASES – Total Observed Anxiety Expression	23.39 (14.61)	1-58

Note. ChEAT: Children's Eating Attitude Test. CAPS: Child-Adolescent Perfectionism Scale. CASES: Child and Adolescent Stress and Emotion Scale.

Correlations were performed to test the associations between DE, SOP, SPP and emotional reactivity (Figure 3). There were significant positive correlations between ChEAT and SOP scores, ChEAT and SPP scores, and SOP and SPP scores. Non-significant correlations were found between ChEAT and CASES scores, SOP and CASES scores, and SPP and CASES scores.

The significant associations between DE, SOP and SPP were further examined using the CAPS dimension scores and ChEAT scores in a multiple linear regression. Although the model was significant ( $F(2, 64) = 5.48, p = .006, R^2 = .146$ ), only SPP scores significantly explained the variance in the ChEAT scores ( $B = .168, SE B = .073, p = .025$ ). SOP was non-significant in the model ( $B = .001, SE B = .001, p = .406$ ). Since the associations between all three variables were non-significant, follow-up hierarchical regressions and mediation analyses were not employed.

Exploratory analyses were conducted to determine whether the subcomponent scores of the CASES were correlated with the ChEAT scores. The subcomponent scores all violated normality based on the Shapiro-Wilk test, and corrective Log transformations were unsuccessful. Spearman's rank correlations found that the intensity of facial anxiety

Figure 3

Pearson's correlations between questionnaire measures

	ChEAT	CAPS – Self-Oriented	CAPS – Socially-Prescribed	CASES – Total Observed Anxiety Expressions
ChEAT	1			
CAPS – Self-Oriented	0.275*	1		
CAPS- Socially-Prescribed	0.370**	0.521**	1	
CASES – Total Observed Anxiety Expressions	0.116	-0.165	-0.115	1

\*\* Correlation is significant at  $p < 0.01$ \* Correlation is significant at  $p < 0.05$ 

expressions were positively correlated with ChEAT scores ( $r(65) = .25$ ,  $p = .040$ ); however, the intensity of bodily anxiety expressions ( $r(65) = -.02$ ,  $p = .887$ ) and vocal anxiety expressions ( $r(65) = .11$ ,  $p = .372$ ) were not correlated with ChEAT scores.

## DISCUSSION

Past research has linked multidimensional perfectionism and emotional reactivity to DE in adolescents (Evans et al., 2019) and adults (Lilenfeld et al., 2006), yet there are few studies that investigate these associations in preadolescents (Rosewall et al., 2019). The results of the current study revealed that preadolescents with higher levels of SOP and SPP experienced higher levels of DE; however, whilst SPP significantly explained the variance in DE, SOP did not significantly contribute to the model. This partially supports our hypothesis that dimensions of perfectionism would be associated with DE in preadolescents. Inconsistent with our hypotheses, emotional reactivity was not significantly associated with DE or the perfectionism dimensions, potentially suggesting that emotional reactivity is not a risk factor for DE, nor a mediator between perfectionism and DE, in preadolescents.

The finding that SPP significantly explains variance in DE is consistent with literature arguing that SPP is a maladaptive form of perfectionism that is more broadly related to DE outcomes (Flett et al., 2016; Hewitt et al., 1995; Malivoire et al., 2019). If DE relates to placing excessive worth on one's weight and shape, partly due to an awareness of how Western society values "thinness" (Warren et al., 2005, p. 241), those who feel an external pressure to be perfect may adhere to socially prescribed body ideals (Donahue et al., 2018). Indeed, the perpetuation of unrealistic cultural body ideals communicated by parents, peers, or mass media has been linked to DE outcomes (Levine & Murnen, 2009), with boys and girls as young as 8–10 years demonstrating an awareness of such ideals (Shapiro et al., 1997). Therefore, preadolescents with heightened levels of SPP may perceive a greater pressure to strive towards these standards, thus fostering DE attitudes and behaviours (Donahue et al., 2018). This may be particularly true if preadolescents with increased SPP believe they will receive social approval for satisfying the perceived expectations of those around them, reinforcing their attitudes and perhaps increasing DE further (Flett et al., 1991; Lieberman et al., 2001). Altogether, our findings indicate that SPP is associated with DE in preadolescents, perhaps due to the application of maladaptive perfectionism to socially set body ideals.

The present study also revealed that although SOP was positively correlated with DE, SOP did not significantly explain the variance in DE after SPP was accounted for. These findings contradict literature that argues SOP is an independent risk factor for DE (Sherry et al., 2003) and suggests SOP is either less influential in the development of DE in preadolescents or is indirectly associated with DE through another factor. Sociocultural theories of eating pathology propose that a perceived social pressure to be thin can facilitate a cognitive and affective internalisation of thinness body ideals, leading to body dissatisfaction and DE (Stice, 2002). This concept can be applied to the dimensions of perfectionism, whereby body ideals related to SPP are converted into an inflexible intrapersonal standard that is then akin to SOP (Soares et al., 2009).

Whilst perfectionism is prospectively related to thin ideal internalisation and thus ED symptoms in adolescents (Boone et al., 2011), a community sample of preadolescents may be too young to have internalised body ideals within their self-oriented standards of perfectionism. In other words, preadolescents may experience the social pressure of a body ideal, but are perhaps too young to turn body ideals into an internalised and self-oriented pressure. Therefore, SOP's association with DE may have been rendered non-significant in the present study after accounting for SPP, as preadolescents are potentially too young to adopt SOP towards eating behaviours.

The present study's results demonstrated that emotional reactivity was not significantly associated with DE in preadolescents, opposing the proposed mediation model, and the view that emotional reactivity is a risk factor for DE (Evans et al., 2019). This finding contrasts prior research that identified a link between emotional reactivity and DE, and theories which suggest DE may develop as a coping mechanism to regulate heightened emotions (Evans et al., 2019; Messerli-Burgy et al., 2018; Monteleone et al., 2020). However, research that considers emotional reactivity as a risk factor for DE is in its relatively early stages, with the studies available mainly relying on cross-sectional data in adults with diagnosed EDs (Monteleone et al., 2020). Therefore, such results may instead communicate that emotional reactivity is a potential symptom of EDs that can originate from more long-term clinical impairment, rather than a correlate of subclinical DE in preadolescents. For example, women with anorexia nervosa can demonstrate disrupted physiology due to malnutrition, potentially leading to the abnormal emotional reactivity observed in prior studies (Chami et al., 2019; Diaz-Marsa et al., 2021). Furthermore, our findings are inconsistent with research that has used alternative measures of emotional reactivity. Juarascio et al. (2016) found heightened emotional reactivity predicted DE across time in adolescents when using a measure that captured a variety of negative emotions following a distress-inducing task. This measure may enable us to capture a more comprehensive measure of emotional reactivity and identify more nuanced associations with DE. Altogether, whilst the cross-sectional limitations of past studies may impact interpretations of the association between emotional reactivity and DE, non-significant results in the current study may be due to the relatively narrow measurement of emotional reactivity.

Furthermore, the non-significant association between emotional reactivity and DE may also be due to the present study's observational measurement of emotional reactivity. Although the CASES was used in prior research to investigate emotional reactivity in children and adolescents (Burkholder et al., 2016), the CASES measures external expressions of anxiety rather than individuals' internal feelings. This may be particularly important as emotional expression suppression is associated with DE, indicating that individuals with elevated levels of DE may demonstrate less behavioural signs of emotionality despite possibly experiencing increased emotional intensity (Ortiz et al., 2019). Hence, the present findings perhaps contrasted previous studies as the latter utilised self-report measurements of affect, which potentially assessed emotional reactivity more insightfully after the experimental induction of stress (Juarascio et al., 2016; Monteleone et al., 2020). This could be due to participants being more willing to report their internal emotional states, rather than express them outwardly; however, self-report measures can also introduce respondent bias, as participants could additionally experience trouble with reporting specific internal feelings (Evans et al., 2019). Furthermore, emotional expression is deemed as prevalent in preadolescence due to the onset of puberty (Rapee et al., 2019). Therefore, whilst the measurement of emotional reactivity may have influenced the present study's results, it is uncertain as to whether emotional reactivity is related to DE in preadolescents.

Non-significant associations were also found between emotional reactivity and the dimensions of perfectionism, further contradicting the hypothesised mediation model, and contrasting previous research which suggests elevated levels of perfectionism lead to heightened emotional reactivity (Dunkley et al., 2014; Hewitt et al., 2002). These inconsistent findings may be attributed to differences in methodologies. For instance, Dunkley et al. (2014) asked participants to use daily diaries to report

on various stressors they experienced throughout their day over several days, whereas the present study experimentally induced one specific stressor. Since emotional reactivity is a multifaceted construct (Nock et al., 2008), the day-to-day nature of Dunkley and colleagues' study may have captured the frequency and duration of emotional reactions, while the present study predominantly measured their behavioural intensity. Therefore, there are possible associations between emotional reactivity and the dimensions of perfectionism in preadolescents; however, the methodology of the present study may have limited the finding of such associations.

### Limitations and Future Directions

The present study was subject to various limitations. Firstly, this study did not measure preadolescent awareness and internalisation of body ideals. Therefore, it cannot be confirmed that the awareness of socially prescribed body ideals was responsible for the association between SPP and DE, and lack of body ideal internalisation rendered SOP non-significant in the DE regression model. Conversely, some literature has identified an association between body ideal internalisation and DE in preadolescent girls (Blowers et al., 2003; Evans et al., 2013), which suggests that preadolescents are potentially old enough to cognitively and affectively incorporate such societal standards into their self-concept (Jankauskiene & Baceviciene, 2022); however, seemingly no research has specifically investigated SOP in relation to body ideal internalisation and DE in preadolescents. Therefore, future research should include measures of ideal internalisation, such as the revised Sociocultural Attitudes Towards Appearance Questionnaire (Schaefer et al., 2016), to develop a more comprehensive understanding of perfectionism and DE in preadolescents.

Another limitation of the present study may explain the lack of significant association between emotional reactivity and DE. Exploratory analyses with CASES scores revealed that DE was associated with the intensity of facial expressions of anxiety, but not bodily or vocal expressions. This finding perhaps reflects that coders may find facial expressions of anxiety as less ambiguous to interpret (Zhang et al., 2018). For instance, a fearful face is potentially easier to deduce as an anxiety expression, whereas nervous fidgeting could be misconstrued for hyperactivity. These challenges plausibly led to decreased precision in identifying anxiety expressions, thus suggesting that the measurement of emotional reactivity was not maximally accurate. Such suggestions should be considered tentatively due to the exploratory nature of these analyses, but future research could combine different emotional reactivity methodologies to address this limitation. Such methodologies could include both behavioural and self-report scales in order to combat each measures' individual limitations, and thus clarify the potential association between emotional reactivity and DE in preadolescents.

Thirdly, the present study did not include nor measure child weight status as a covariate of DE. This is potentially important as research demonstrates preadolescents with higher body mass index (BMI) are more likely to engage in DE behaviours (Murray et al., 2022); however, defining weight status according to BMI percentiles is controversial as BMI is an inaccurate measure of fat mass in children (Agbaje, 2024). Therefore, it is unclear how weight status influences DE in preadolescents, and whether it would affect the present study's findings. Future research should use alternate measures of weight status, such as waist-circumference-to-height-ratio (Agbaje, 2024), to identify how weight status may influence DE in relation to perfectionism and emotional reactivity.

Lastly, it is important to highlight the cross-sectional approach used in the current study, which may restrict conclusions that can be drawn regarding the causality of SPP as a risk factor in the development of DE. Future studies should thereby follow preadolescents into adolescence or adulthood to establish the influence of perfectionism as a risk factor in the trajectory of DE; however, establishing temporal precedence of either perfectionism or emotional reactivity in the development of DE does not always guarantee causality, as other unmeasured variables could be responsible for both the risk factor and DE (Jansen, 2016). Therefore, future research could also consider experimental psychopathology studies that examine whether the minor activation of a proposed risk

factor in healthy preadolescents leads to short-term DE attitudes (Jansen, 2016). For example, Shafran et al. (2006) found that when adult participants were asked to pursue high levels of perfectionism for 24 hours, they demonstrated decreased food intake compared to participants who were told to set minimal standards for themselves. Such research might be highly valuable to determine preadolescent risk factors; however, comprehensive ethical considerations would need to be made to ensure the protection of participants from potential psychological distress. Altogether, future research should consider a variety of study designs to further understand the complex aetiology of DE in preadolescents.

### Implications

While the presence of DE in preadolescents is not a novel finding (Herle et al., 2020), it remains concerning that such harmful attitudes and behaviours were reported by this community sample (Thomas et al., 2021). This highlights a need for early screening tools (Thomas et al., 2021), and emphasises the importance of interventions that prevent DE from progressing into diagnosable EDs (Pursey et al., 2021).

Furthermore, research has shown that current interventions demonstrate limited effectiveness in preventing and treating DE development (Pennesi & Wade, 2016). This may be because a one-size-fits-all approach is likely unattainable due to the heterogeneous nature of DE (Pennesi & Wade, 2016). Instead, extensive research that informs targeted interventions may be the best route for improving the wellbeing of children at risk for developing DE. After future research is conducted, the association between SPP and DE in the present study may suggest a point of intervention for preadolescents. Therefore, an intervention which targets perfectionism in preadolescents, whilst additionally addressing the harmful nature of sociocultural body ideals, may be a valuable programme for preventing or reducing DE in this age group.

### CONCLUSION

Overall, the present study provides evidence for the association between SPP and DE in preadolescence. While high levels of SPP were associated with higher levels of DE, SOP did not significantly explain the variance in DE after accounting for SPP. Furthermore, emotional reactivity was not significantly associated with DE or the perfectionism dimensions, thus failing to support the proposed mediation model between variables. Although these results draw attention to the potential influence of SPP and SOP in preadolescent development of DE, they also highlight the importance of employing various methodological designs to capture complex constructs. Given the influence of DE on later ED development and the presence of such attitudes and behaviours in the current study, early screening tools and interventions that target SPP are potentially crucial for preventing later ED pathology. Therefore, once further longitudinal and experimental research is conducted to better understand the roles of perfectionism and emotional reactivity in DE, the higher probability there is of delivering evidence-based interventions that positively impact the wellbeing of children.

### SUPPLEMENTARY MATERIAL

Appendix

# Article references

- Agbaje, A. O. (2024). Waist-circumference-to-height-ratio had better longitudinal agreement with DEXA-measured fat mass than BMI in 7237 children. *Pediatric Research*, *96*, 1369–1380. <https://doi.org/10.1038/s41390-024-03112-8>
- Allen, A. P., Kennedy, P. J., Dockray, S., Cryan, J. F., Dinan, T. G., & Clarke, G. (2017). The Trier Social Stress test: Principles and practice. *Neurobiology of Stress*, *6*, 113–126. <https://doi.org/10.1016/j.yjnstr.2016.11.001>
- Anton, S. D., Han, H., Newton, R. L., Martin, C. K., York-Crowe, E., Stewart, T. M., & Williamson, D. A. (2006). Reformulation of the children's eating attitudes test (cheat): Factor structure and scoring method in a non-clinical population. Eating and Weight Disorders - Studies on Anorexia, Bulimia and Obesity, *11*(4), 201–210. <https://doi.org/10.1007/bf03327572>
- Arcelus, J., Mitchell, A. J., Wales, J., & Nielsen, S. (2011). Mortality rates in patients with anorexia nervosa and other eating disorders: a meta-analysis of 36 studies. *Archives of general psychiatry*, *68*(7), 724–731. <https://doi.org/10.1001/archgenpsychiatry.2011.74>
- Asl, E. M., Abdi, L., Sadegh, A. M., & Behrouzian, F. (2021). The mediating role of self-compassion in the relationship between positive reactivity, negative reactivity, and perfectionism with disordered eating. *Journal of Education and Health Promotion*, *10*(1). [https://doi.org/10.4103/jehp.jehp\\_1485\\_20](https://doi.org/10.4103/jehp.jehp_1485_20)
- Blowers, L. C., Loxton, N. J., Grady-Flessner, M., Occhipinti, S., & Dawe, S. (2003). The relationship between sociocultural pressure to be thin and body dissatisfaction in preadolescent girls. *Eating Behaviors*, *4*(3), 229–244. [https://doi.org/10.1016/s1471-0153\(03\)00018-7](https://doi.org/10.1016/s1471-0153(03)00018-7)
- Bodell, L. P., Egbert, A. H., Anaya, C., & Wildes, J. E. (2022). Associations between emotion reactivity and eating disorder symptoms in a transdiagnostic treatment seeking sample. *International Journal of Eating Disorders*, *55*(10), 1390–1396. <https://doi.org/10.1002/eat.23808>
- Boone, L., Soenens, B., & Braet, C. (2011). Perfectionism, body dissatisfaction, and bulimic symptoms: The intervening role of perceived pressure to be thin and thin ideal internalization. *Journal of Social and Clinical Psychology*, *30*(10), 1043–1068. <https://doi.org/10.1521/jscp.2011.30.10.1043>
- Burkholder, A. R., Koss, K. J., Hostinar, C. E., Johnson, A. E., & Gunnar, M. R. (2016). Early life stress: Effects on the regulation of anxiety expression in children and adolescents. *Social Development*, *25*(4), 777–793. <https://doi.org/10.1111/sode.12170>
- Buske-Kirschbaum, A., Jobst, S., Wustmans, A., Kirschbaum, C., Rauh, W., & Hellhammer, D. (1997). Attenuated free cortisol response to psychosocial stress in children with atopic dermatitis. *Psychosomatic Medicine*, *59*(4), 419–426. <https://doi.org/10.1097/00006842-199707000-00012>
- Chami, R., Monteleone, A. M., Treasure, J., & Monteleone, P. (2019). Stress hormones and eating disorders. *Molecular and Cellular Endocrinology*, *497*, 110349. <https://doi.org/10.1016/j.mce.2018.12.009>
- Chang, E. C., Ivezaj, V., Downey, C. A., Kashima, Y., & Morady, A. R. (2008). Complexities of measuring perfectionism: Three popular perfectionism measures and their relations with eating disturbances and health behaviors in a female college student sample. *Eating Behaviors*, *9*(1), 102–110. <https://doi.org/10.1016/j.eatbeh.2007.06.003>
- Coombs, E., Brosnan, M., Bryant-Waugh, R., & Skevington, S. M. (2011). An investigation into the relationship between eating disorder psychopathology and autistic symptomatology in a non-clinical sample. *British Journal of Clinical Psychology*, *50*(3), 326–338. <https://doi.org/10.1348/014466510x524408>
- Dahl, R. E., & Gunnar, M. R. (2009). Heightened stress responsiveness and emotional reactivity during pubertal maturation: Implications for psychopathology. *Development and Psychopathology*, *21*(1), 1–6. <https://doi.org/10.1017/S0954579409000017>
- DiazMarsa, M., MacDowell, K., de la TorreLuque, A., Caso, J. R., Faya, M., Gutierrez, S., Soto, M., Pemau, A., DiazCarracedo, P., CarrascoDiaz, A., Leza, J. C., Graell, M., & Carrasco, J. L. (2021). Inflammatory dysregulation in women with an eating disorder: Relationships with altered emotional reactivity. *International Journal of Eating Disorders*, *54*(10), 1843–1854. <https://doi.org/10.1002/eat.23598>
- Donahue, J. M., Reilly, E. E., Anderson, L. M., Scharmer, C., & Anderson, D. A. (2018). Evaluating associations between perfectionism, emotion regulation, and eating disorder symptoms in a mixed-gender sample. *Journal of Nervous & Mental Disease*, *206*(11), 900–904. <https://doi.org/10.1097/nmd.0000000000000895>
- Dunkley, D. M., Mandel, T., & Ma, D. (2014). Perfectionism, neuroticism, and daily stress reactivity and coping effectiveness 6 months and 3 years later. *Journal of Counseling Psychology*, *61*(4), 616–633. <https://doi.org/10.1037/cou0000036>
- Evans, B. C., Felton, J. W., Lagacey, M. A., Manasse, S. M., Lejuez, C. W., & Juarascio, A. S. (2019). Impulsivity and affect reactivity prospectively predict disordered eating attitudes in adolescents: A 6-year Longitudinal Study. *European Child & Adolescent Psychiatry*, *28*(9), 1193–1202. <https://doi.org/10.1007/s00787-018-01267-4>
- Evans, E. H., Tovée, M. J., Boothroyd, L. G., & Drewett, R. F. (2013). Body dissatisfaction and disordered eating attitudes in 7- to 11-year-old girls: Testing a sociocultural model. *Body Image*, *10*(1), 8–15. <https://doi.org/10.1016/j.bodyim.2012.10.001>
- Ferreiro, F., Seoane, G., & Senra, C. (2012). Gender-related risk and protective factors for depressive symptoms and disordered eating in adolescence: A 4-year Longitudinal Study. *Journal of Youth and Adolescence*, *41*(5), 607–622. <https://doi.org/10.1007/s10964-011-9718-7>
- Flett, G. L., Hewitt, P. L., Besser, A., Su, C., Vaillancourt, T., Boucher, D., Munro, Y., Davidson, L. A., & Gale, O. (2016). The child-adolescent perfectionism scale. *Journal of Psychoeducational Assessment*, *34*(7), 634–652. <https://doi.org/10.1177/0734282916651381>
- Flett, G. L., Hewitt, P. L., Blankstein, K. R., & Koledin, S. (1991). Dimensions of perfectionism and irrational thinking. *Journal of Rational-Emotive and Cognitive-Behavior Therapy*, *9*(3), 185–201. <https://doi.org/10.1007/bf01061229>
- Forbush, K., Heatherton, T. F., & Keel, P. K. (2006). Relationships between perfectionism and specific disordered eating behaviors. *International Journal of Eating Disorders*, *40*(1), 37–41. <https://doi.org/10.1002/eat.20310>
- Galmiche, M., Déchelotte, P., Lambert, G., & Tavolacci, M. P. (2019). Prevalence of eating disorders over the 2000–2018 period: a systematic literature review. *The American journal of clinical nutrition*, *109*(5), 1402–1413.
- Garner, D. M., & Garfinkel, P. E. (1979). The eating attitudes test: An index of the symptoms of anorexia nervosa. *Psychological Medicine*, *9*(2), 273–279. <https://doi.org/10.1017/s0033291700030762>
- Goldschmidt, A. B., Wonderlich, S. A., Crosby, R. D., Engel, S. G., Lavender, J. M., Peterson, C. B., Crow, S. J., Cao, L., & Mitchell, J. E. (2014). Ecological momentary assessment of stressful events and negative affect in bulimia nervosa. *Journal of Consulting and Clinical Psychology*, *82*(1), 30–39. <https://doi.org/10.1037/a0034974>
- Haynos, A. F., Utzinger, L. M., Lavender, J. M., Crosby, R. D., Cao, L., Peterson, C. B., Crow, S. J., Wonderlich, S. A., Engel, S. G., Mitchell, J. E., Le Grange, D., & Goldschmidt, A. B. (2018). Subtypes of adaptive and maladaptive perfectionism in anorexia nervosa: Associations with eating disorder and affective symptoms. *Journal of Psychopathology and Behavioral Assessment*, *40*(4), 691–700. <https://doi.org/10.1007/s10862-018-9672-8>
- Hertle, M., Stavola, B. D., Hübel, C., Abdulkadir, M., Ferreira, D. S., Loos, R. J., Bryant-Waugh, R., Bulik, C. M., & Micali, N. (2020). A longitudinal study of eating behaviours in childhood and later eating disorder behaviours and diagnoses. *The British Journal of Psychiatry*, *216*(2), 113–119. <https://doi.org/10.1192/bjp.2019.174>
- Hewitt, P. L., & Flett, G. L. (1991). Perfectionism in the self and social contexts: Conceptualization, assessment, and association with psychopathology. *Journal of Personality and Social Psychology*, *60*(3), 456–470. <https://doi.org/10.1037/0022-3514.60.3.456>
- Hewitt, P. L., Caelian, C. F., Flett, G. L., Sherry, S. B., Collins, L., & Flynn, C. A. (2002). Perfectionism in children: Associations with depression, anxiety, and anger. *Personality and Individual Differences*, *32*(6), 1049–1061. [https://doi.org/10.1016/s0191-8869\(01\)00109-x](https://doi.org/10.1016/s0191-8869(01)00109-x)
- Hewitt, P. L., Flett, G. L., & Ediger, E. (1995). Perfectionism traits and perfectionistic self-presentation in eating disorder attitudes, characteristics, and symptoms. *International Journal of Eating Disorders*, *18*(4), 317–326. [https://doi.org/10.1002/1098-108x\(199512\)18<317::aid-eat2260180404>3.0.co;2-2](https://doi.org/10.1002/1098-108x(199512)18<317::aid-eat2260180404>3.0.co;2-2)
- IBM. (2020). IBM Statistics for MacBook (Version 27.0) [Computer software]. IBM. <https://www.ibm.com/support/pages/downloading-ibm-spss-statistics-27010>
- Jankauskiene, R., & Baceviciene, M. (2022). Media pressures, internalization of appearance ideals and disordered eating among adolescent girls and boys: Testing the moderating role of body appreciation. *Nutrients*, *14*(11). <https://doi.org/10.3390/nu14112227>
- Jansen, A. (2016). Eating disorders need more experimental psychopathology. *Behaviour Research and Therapy*, *86*, 2–10. <https://doi.org/10.1016/j.brt.2016.08.004>
- Johnston, J., Shu, C. Y., Hoiles, K. J., Clarke, P. J. F., Watson, H. J., Dunlop, P. D., & Egan, S. J. (2018). Perfectionism is associated with higher eating disorder symptoms and lower remission in children and adolescents diagnosed with eating disorders. *Eating Behaviors*, *30*, 55–60. <https://doi.org/10.1016/j.eatbeh.2018.05.008>
- Juarascio, A. S., Felton, J. W., Borges, A. M., Manasse, S. M., Murray, H. B., & Lejuez, C. W. (2016). An investigation of negative affect, reactivity, and distress tolerance as predictors of disordered eating attitudes across adolescence. *Journal of Adolescence*, *49*(1), 91–98. <https://doi.org/10.1016/j.adolescence.2016.02.005>
- Kirschbaum, C., Pirke, K.-M., & Hellhammer, D. H. (1993). The "Trier Social Stress Test" – a tool for investigating psychobiological stress responses in a laboratory setting. *Neuropsychobiology*, *28*(1–2), 76–81. <https://doi.org/10.1159/000190004>
- Kotler, L. A., Cohen, P., Davies, M., Pine, D. S., & Walsh, B. T. (2001). Longitudinal relationships between childhood, adolescent, and adult eating disorders. *Journal of the American Academy of Child & Adolescent Psychiatry*, *40*(12), 1434–1440. <https://doi.org/10.1097/00004583-200112000-00014>
- Levine, M. P., & Murnen, S. K. (2009). "Everybody knows that mass media are/are not [pick one] a cause of eating disorders": A critical review of evidence for a causal link between media, negative body image, and disordered eating in females. *Journal of Social and Clinical Psychology*, *28*(1), 9–42. <https://doi.org/10.1521/jscp.2009.28.1.9>
- Levinson, C. A., Cusack, C., Brown, M. L., & Smith, A. R. (2022). A network approach can improve eating disorder conceptualization and treatment. *Nature Reviews Psychology*, *1*(7), 419–430. <https://doi.org/10.1038/s44159-022-00062-y>
- Lieberman, M., Gauvin, L., Bukowski, W. M., & White, D. R. (2001). Interpersonal influence and disordered eating behaviors in adolescent girls. *Eating Behaviors*, *2*(3), 215–236. [https://doi.org/10.1016/s1471-0153\(01\)00030-7](https://doi.org/10.1016/s1471-0153(01)00030-7)
- Lilenfeld, L. R. R., Wonderlich, S., Riso, L. P., Crosby, R., & Mitchell, J. (2006). Eating disorders and personality: A methodological and Empirical Review. *Clinical Psychology Review*, *26*(3), 299–320. <https://doi.org/10.1016/j.cpr.2005.10.003>
- Lozano, L. M., Valor-Segura, I., & Lozano, L. (2015). Could a perfectionism context produce unhappy children? *Personality and Individual Differences*, *80*, 12–17. <https://doi.org/10.1016/j.paid.2015.01.022>
- Malivoire, B. L., Kuo, J. R., & Antony, M. M. (2019). An examination of emotion dysregulation in maladaptive perfectionism. *Clinical Psychology Review*, *71*, 39–50. <https://doi.org/10.1016/j.cpr.2019.04.006>
- Maloney, M. J., McGuire, J., Daniels, S. R., & Specker, B. (1989). Dieting behavior and eating attitudes in children. *Pediatrics*, *84*(3), 482–489. <https://doi.org/10.1542/peds.84.3.482>
- Messerli-Bürgy, N., Stülz, K., Kakebeke, T. H., Arhab, A., Zysset, A. E., Leeger-Aschmann, C. S., Schmutz, E. A., Meyer, A. H., Ehlert, U., Garcia-Burgos, D., Kriemler, S., Jenni, O. G., Puder, J. J., & Munsch, S. (2018). Emotional eating is related with temperament but not with stress biomarkers in preschool children. *Appetite*, *120*, 256–264. <https://doi.org/10.1016/j.appet.2017.08.032>
- Monteleone, A. M., Ruzzi, V., Patriello, G., Cascino, G., Pellegrino, F., Vece, A., Monteleone, P., & Maj, M. (2020). Emotional reactivity and eating disorder related attitudes in response to the Trier Social Stress test: An experimental study in people with anorexia nervosa and with bulimia nervosa. *Journal of Affective Disorders*, *274*, 23–30. <https://doi.org/10.1016/j.jad.2020.05.051>
- Murray, S. B., Blashill, A. J., & Calzo, J. P. (2022). Prevalence of disordered eating and associations with sex, pubertal maturation, and weight in children in the US. *JAMA Pediatrics*, *176*(10), 1039. <https://doi.org/10.1001/jamapediatrics.2022.2490>
- National Institute for Health and Care Excellence. (2024, July). Eating Disorders: How common is it? <https://cks.nice.org.uk/topics/eating-disorders/background-information/prevalence/>
- Nock, M. K., Wedig, M. M., Holmberg, E. B., & Hooley, J. M. (2008). The emotion reactivity scale: Development, evaluation, and relation to self-injurious thoughts and behaviors. *Behavior Therapy*, *39*(2), 107–116. <https://doi.org/10.1016/j.beth.2007.05.005>
- Oros, L. B., Iuorno, O., & Serppe, M. (2017). Child perfectionism and its relationship with personality, excessive parental demands, depressive symptoms and experience of positive emotions. *The Spanish Journal of Psychology*, *20*. <https://doi.org/10.1017/sjp.2017.9>
- Ortiz, S., Knauff, K., Smith, A., & Kalia, V. (2019). Expressive suppression mediates the relation between disordered eating and suicidal ideation. *Journal of Clinical Psychology*, *75*(10), 1943–1958. <https://doi.org/10.1002/jclp.22830>
- Pennesi, J.-L., & Wade, T. D. (2016). A systematic review of the existing models of disordered eating: Do they inform the development of effective interventions? *Clinical Psychology Review*, *43*, 175–192. <https://doi.org/10.1016/j.cpr.2015.12.004>

- Pursey, K. M., Burrows, T. L., Barker, D., Hart, M., & Paxton, S. J. (2021). Disordered eating, body image concerns, and weight control behaviors in primary school aged children: A systematic review and metaanalysis of Universal-Selective Prevention Interventions. *International Journal of Eating Disorders, 54*(10), 1730–1765. <https://doi.org/10.1002/eat.23571>
- Rapee, R. M., Oar, E. L., Johnco, C. J., Forbes, M. K., Fardouly, J., Magson, N. R., & Richardson, C. E. (2019). Adolescent development and risk for the onset of social-emotional disorders: A review and conceptual model. *Behaviour Research and Therapy, 123*. <https://doi.org/10.1016/j.brat.2019.103501>
- Rosewall, J. K., Gleaves, D. H., & Latner, J. D. (2019). Moderators of the relationship between body dissatisfaction and eating pathology in preadolescent girls. *The Journal of Early Adolescence, 40*(3), 328–353. <https://doi.org/10.1177/0272431619837385>
- Santomauro, D. F., Melen, S., Mitchison, D., Vos, T., Whiteford, H., & Ferrari, A. J. (2021). The hidden burden of eating disorders: An extension of estimates from the global burden of disease study 2019. *The Lancet Psychiatry, 8*(4), 320–328. [https://doi.org/10.1016/s2215-0366\(21\)00040-7](https://doi.org/10.1016/s2215-0366(21)00040-7)
- Schaefer, L. M., Harriger, J. A., Heinberg, L. J., Soderberg, T., & Kevin Thompson, J. (2016). Development and validation of the sociocultural attitudes towards appearance questionnaire-4-revised (SATAQ-4R). *International Journal of Eating Disorders, 50*(2), 104–117. <https://doi.org/10.1002/eat.22590>
- Shafran, R., Lee, M., Payne, E., & Fairburn, C. G. (2006). The impact of manipulating personal standards on eating attitudes and behaviour. *Behaviour Research and Therapy, 44*(6), 897–906. <https://doi.org/10.1016/j.brat.2005.08.009>
- Shapiro, S., Newcomb, M., & Burns Loeb, T. (1997). Fear of fat, disregulated-restrained eating, and body-esteem: Prevalence and gender differences among eight- to ten-year-old children. *Journal of Clinical Child Psychology, 26*(4), 358–365. [https://doi.org/10.1207/s15374424jccp2604\\_4](https://doi.org/10.1207/s15374424jccp2604_4)
- Sherry, S. B., Hewitt, P. L., Besser, A., McGee, B. J., & Flett, G. L. (2003). Self-oriented and socially prescribed perfectionism in the eating disorder inventory perfectionism subscale. *International Journal of Eating Disorders, 35*(1), 69–79. <https://doi.org/10.1002/eat.10237>
- Smolak, L., & Levine, M. P. (1994). Psychometric Properties of the Children's Eating Attitudes Test. *International Journal of Eating Disorders, 16*(3), 275–282. [https://doi.org/10.1002/1098-108x\(199411\)16:3<275::aid-eat2260160308>3.0.co;2-u](https://doi.org/10.1002/1098-108x(199411)16:3<275::aid-eat2260160308>3.0.co;2-u)
- Smolak, L., & Levine, M. P. (2015). Body Image, Disordered Eating, and Eating Disorders. In *The Wiley Handbook of Eating Disorders, Assessment, Prevention, Treatment, Policy, and Future Directions* (pp. 4–10). John Wiley & Sons, Ltd.
- Soares, M. J., Macedo, A., Bos, S. C., Marques, M., Maia, B., Pereira, A. T., Gomes, A., Valente, J., Pato, M., & Azevedo, M. H. (2009). Perfectionism and eating attitudes in Portuguese students: A longitudinal study. *European Eating Disorders Review, 17*(5), 390–398. <https://doi.org/10.1002/erv.926>
- Stice, E. (2002). Risk and maintenance factors for eating pathology: A meta-analytic review. *Psychological Bulletin, 128*(5), 825–848. <https://doi.org/10.1037/0033-2909.128.5.825>
- Thomas, K. S. (2022). The role of cognitive control in the co-occurrence of disordered eating and internalizing symptoms in preadolescence [Unpublished doctoral thesis]. Cardiff University.
- Thomas, K. S., Williams, M. O., & Vanderwert, R. E. (2021). Disordered eating and internalizing symptoms in preadolescence. *Brain and Behaviour, 11*(1). <https://doi.org/10.1002/brb3.1904>
- Wade, T. D., O'Shea, A., & Shafran, R. (2016). Perfectionism and Eating Disorders. In F. M., Sirois & D. S., Molnar (Eds.), *Perfectionism, Health, and Well-Being* (pp. 205–222). Springer.
- Warren, C. S., Gleaves, D. H., Cepeda-Benito, A., Fernandez, M. del, & Rodriguez-Ruiz, S. (2005). Ethnicity as a protective factor against internalization of a thin ideal and body dissatisfaction. *International Journal of Eating Disorders, 37*(3), 241–249. <https://doi.org/10.1002/eat.20102>
- Zhang, H., Chen, X., Chen, S., Li, Y., Chen, C., Long, Q., & Yuan, J. (2018). Facial expression enhances emotion perception compared to vocal prosody: Behavioral and Fmri Studies. *Neuroscience Bulletin, 34*(5), 801–815. <https://doi.org/10.1007/s12264-018-0231-9>